

Open Digital Education Space: Classification of E-Services at University



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Abstract: *The article suggests new approaches to describing digital education space. The differentiation of the concepts "digital pedagogy", "digital didactics" and "digital education" is carried out. The study of the problem of e-services typology has both practical importance for structuring a digital education space of the university and methodological, prognostic significance that allows the authors to solve the task of developing a fundamentally new type of educational e-services. In the typology of services, it is necessary to single out services of educational program management and services of the content management, for digital education space. The second group of services is classified by the authors on two bases: firstly, stages of the content acquisition and, secondly, the theory of multiple intelligence, which is interpreted in terms of "teacher intelligence", proposed by the authors.*

Index Terms: *digital didactics, digital education, digital education space of the university, typology, e-service, multiple intelligence, teacher intelligence.*

I. INTRODUCTION

In the context of modern global educational reforms influenced by the development of digital society, it is relevant to consider the information and education environment of university as a part of the open and, at the same time limited to a narrow set of tasks, education space. Nowadays rapid development of equipment and software gives rise to numerous e-services that provide the implementation of educational programs in universities. Being disconnected and related to multi-directional objectives they cannot function effectively. This brings about a problem of their systematization and typologization.

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The determination of the criteria for this typology is a necessary stage preceding the identification of the basis for modeling a complete system of digital support of a teaching and learning process, as well as for the determination of scientific research and developments.

II. LITERATURE REVIEW

First of all, it is necessary to focus on the determination of the conceptual field that makes fundamentals of the typology of e-services.

If we refer to the term "Digital Pedagogics" [1] which is very popular today in Russia, we see it has rather metaphorical meaning. It does not reflect fully those tasks which we traditionally refer to the sphere of pedagogical science. In our opinion, it is necessary to view "Digital Pedagogics" as "New Pedagogics" - the area of scientific knowledge in the system of pedagogical sciences which describes new education in a new digital world. Firstly, it discloses the essence of education, its role in the development of a personality (vospitasnie). Secondly, it develops practical ways and methods (didactics). It will help to enhance the effectiveness of teaching and learning processes by means of digital educational resources and educational technologies. It helps to make a teaching and learning process decentralized, to reorient it to a student's activity, to boost their autonomy and academic mobility. Such an approach requires extra research, as today we can observe the general tendency to the reduction of "digital pedagogics" to "digital didactics" [2], as well as, in general, to limit education to training processes (didactics). The processes of vospitanie, personality development and socialization, which are essential for pedagogical research, are beyond the consideration. However, the models of online services integrating vospitanie, development and training, didactics [3-5] have been already created and work. As an example, it is necessary to mention an electronic course on Social and Emotional Learning (SEL) in the USA and the UK. Modern research confirms our thesis about debatableness of the issue. Noting that now educational processes at all levels are provided by information and communication technologies (ITC), A.A. Andreyev introduces a concept of the electronic pedagogics. It ensures scientific research, description and forecasting of processes in any ICT-packed educational environments [6]. According to V.F. Gabdulkhakov and E.G.



Galimov, the digital pedagogics before being called pedagogics, should develop the principles and the rules of functioning in accordance with the humanistic purposes of education. Besides, they emphasize that IT developers and IT experts should take into consideration a negative impact of IT on a person [7].

III. PROPOSED METHODOLOGY

In the modern context of the higher education, we consider it possible to speak about digital education as a purposeful teaching and learning process in the electronic educational

environment directed to the achievement of a certain educational result. The structure of digital education, in our opinion, has two components: logistics and the content of a pedagogical process in the electronic educational environment. The content of digital education, without having fundamental differences from the traditional education content, has a number of specific features which are defined by the methods of working with this content. With reference to this we find it possible to distinguish the following characteristic features of digital education content: boundlessness of its volume, variability, unpredictability of a trajectory of movement in content, interdisciplinary character, the presentation of scientifically reliable data, interactivity, resource intensity, asynchrony. The shortcomings of such a presentation of education content can be overcome due to modularity, build-in capacity, adaptation to different purposes and integration with other resources and services, availability, mobility, openness, technological effectiveness. Content management in higher education is possible within competence differentiation. For example, in Russia usually the following components of education content are allocated: directed to forming universal, all-professional and professional competences. The requirement to observe the principles of integration and differentiation still exists. At the same time it is important to note that the paradigm shift, which introduces digital education into a teaching and learning process, is revealed not only in content, but in the sphere of ways (methods) of process management. In its turn, the logistics of management of educational process support in online environment presupposes process management of teaching and learning (content management), on the one hand, and administration of education, on the other hand.

IV. ALGORITHM

We consider logistics of content management as process management of broadcasting, acquiring knowledge and generating new knowledge (subjectively and objectively new) by means of online services and resources. They correspond to the field of digital pedagogics which is defined as "digital didactics" today. We refer to these resources: online courses on the basic subjects studied at Russian Universities at a bachelor's level, placed on the modern education platform "Open Education" and also MOOC. These are complete training courses allowing to gain knowledge in a certain sphere. MOOC differs from professionally-oriented education web-resources. The teaching/learning purpose is not getting a diploma, but mastering meta-subject competences (language, information, design competences

etc.). These competences are necessary for personal and professional development.

Existing online courses are created mainly according to the logic of the established education tradition of disseminating knowledge. This means instructivism – a deductive method of teaching and education process organization, modernized by the programmed training. The latter improves this process only technically without leaving an instructivism paradigm, the so-called "talking head".

V. RESULT ANALYSIS

The analysis of a didactic component of open educational online courses allows us to make a conclusion that methods of implementation of constructivism provisions (inductive methods of content development) have not been found. Besides, the majority of online courses are not based on revolutionary ideas and constructivism provisions. Modern web-services do not reflect resource opportunities of digital education which offers innovative technology solutions. These solutions make an essence a constructivism approach - generation of new knowledge in the course of learning in community [8]. The new approach makes the basis of a design of the World Education Map service (<http://emap.mininuniver.ru/>) developed by the staff of Minin University (Nizhniy Novgorod). The scientific and educational web-service represents the world education space in continuity and progressiveness of development of ideas of great thinkers of education. The "World Education Map" is constructed on the basis of the problem and chronological principles based on our approach to the description of pedagogical concepts and educational models. The web-service is a descriptive analysis tool for the implementation of educational and research activities, professional and personal self-identification, self-development of pre-service and in-service teachers. Unlike other educational resources, the web-service represents new generation of MOOC. It ensures not only knowledge transfer, but also generation of scientific ideas. It allows to interpret and reveal patterns of world education space integration in different historical periods and at the present time. We determine the "World Education Map" as the web-service of content management that integrates three levels of work with content - transfer, acquisition of knowledge and generation of new knowledge. The theory of multiple intelligence seems to be a perspective base for creating a web-service typology. We think it is possible to extrapolate it for a teacher's activity. It is necessary to speak about "teacher intelligence" which we view as a set of a teacher's professional and personal qualities. They become a target reference point for teacher training education programs and make a certain psychology and pedagogical basis of a didactic design of online courses and web-services. The structure of "teacher intelligence" can include six principal components according to the theory of multiple intelligence [9] (Table 1).



Table 1. Description of "Teacher Intelligence"

Type	Description
Abstract	Theoretical knowledge of common cultural, subject, psychology and pedagogical, methodical areas, reflection, work with different types of information
Social	Effective interaction with students, parents, colleagues, administration and other people involved in educational process
Practical	The solution of real educational problems, practical educational activity in real situations and its organization based on a teacher's experience
Emotional	Understanding and expression of personal feelings and other people's emotions in verbal and nonverbal communication for management of teaching activities (empathy, responsibility, flexibility, optimism etc.)
Aesthetic	Creation, expression, transfer and estimation of internal, spiritual, natural and cultural factors and meanings for the purpose of forming a person's set of values
Kinetic	Effective use of motility, nonverbal means of communication, gestures for self-expression and accuracy in goal achievement (teachers' acting skills)

The concepts of web-education, which are widely spread, are oriented to a person's cognitive abilities and to the formation of abstract intelligence. Modern effective web-services, aimed at forming social and emotional intelligence, as well as, modern opportunities ensured by the achievements in the field of artificial intelligence allow us to create the simulator of an education process directed to a teacher's practical intelligence formation. The solution of this task will make it possible: to create the concept of development of simulators in a social and humanitarian sphere; to enrich the theory and practice of a teacher training process; to ensure effective teachers' professional development and facilitate the process of teachers' skill certification. It will also bring about a cardinal shift in the development of digital didactics and implementation of the concept [4] of Open Teachers' Education of the Future. The maintenance of educational program implementation in existing "digital knowledge" conditions should ensure multidirectional connections between all subjects of pedagogical interaction. It also requires new education and administration solutions. There are maintenance services practically in all Russian higher education institutions. They ensure the entire lifecycle educational programs: from career guidance to post-degree support of graduates. In Minin University there are the following web-services:

- 1) at a career guidance level:
 - "Applicant" web-service provides quick interaction between teachers and applicants;
- 2) at the level of implementation of the main professional

educational programme:

- "Teaching/Learning Results" web-service, including online students' assessment sheet and online students' record books. It records students' academic results;
- "Online Schedule" service is intended for schedule management and management of classroom facility;
- "Online Educational" service includes online educational courses on educational programs of Minin University;
- "Teacher Support" service is an information, organizational and technology platform on which one can find online information and educational resources that ensure effective teachers' activity and provide a feedback on different questions/problems arising during the implementation and modernization of an educational process. The aim of the service is monitoring the current situation in the education space of the university, its assessment, searching for effective solutions, providing feedback and stimulating teachers to reflexive activity that is contributive to their professional growth.
- "Professional Development" web-service aims at creating an individual professional development plan for the university staff;

3) at a level of post-degree maintenance [10]:

- "Post-degree Maintenance" web-service is devised to provide young specialists who just start their career with all necessary methodical, psychological support. The web-service is based on the concept of double mentoring [3] which means that a graduate is guided by two mentors. One mentor is from a higher educational institution and the other is from the organization where graduates get their employment. The mentors' duties are ensuring a graduate's successful professional adaptation, professional socialization and opening alluring career opportunities for graduates to keep them in teaching profession;
- "Education Association" web-service is designed to provide coordination of the innovation actions and increase teachers' competitiveness on the principles of network cooperation with regional educational organizations.

"A Configurator of Personal Success" and "An E-portfolio" are two web-services that differ in their aims but provide maintenance of the educational program at all stages of its implementation which makes these services unique.

"The E-portfolio" (<https://ya.mininuniver.ru/portfolio>) is like a "treasure box" of educational, creative and personal achievements of students. Here one can see documentary evidence of students' and graduate students' achievements in different spheres: educational, scientific, public etc. Besides, it is a unique platform for demonstration of personal results. By means of this service employers can get acquainted with the main and additional competences of applicants and choose the most suitable candidates. The reliability of all the materials is provided by the moderator of Minin University.



Thus, the web-service, which gives visual representation of the acquired competences by students, becomes a basis of their career growth and professional development.

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VI. CONCLUSION

The information and education web-service "Configurator of Personal Success" provides purposeful "entrance" to a profession and allows graduate students to manage their career in future. It represents a student's "service book": from the choice of profession to post-degree maintenance. The web-service allows to develop an individual educational trajectory for achievement of the user that allows them to achieve their personal purposes according to their desires, preferences and opportunities. It also makes a student's success obvious. In our opinion, the activity of all subjects of a digital education process in the online educational environment demands competent navigation. Thus, proceeding from the approaches to understanding of "digital education" given above, we designed a typology of electronic educational services. Typologization of educational web-services will close the gap between practical experience of digital education implementation and the level of its theoretical development. The designed approach is the basis for structuring a complete system of education not only for the higher education, but also for the level of comprehensive school as they are similar in the process of education content development and the competence formation process. A complete structured picture of the electronic educational environment allows to specify the place, the role, the functions and the tasks of each separate electronic service and its connection with other services and with the system in general.

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